

The opinion in support of the decision being entered today was  
not written for publication and is not binding  
precedent of the Board

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

Ex parte KONSTANTINOS PAPATHOMAS

Appeal No. 2005-0181  
Application 09/781,631

ON BRIEF

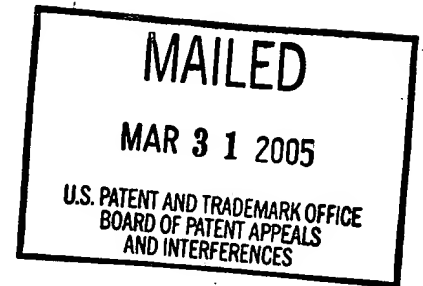
Before WARREN, DELMENDO, and PAWLIKOWSKI, Administrative Patent  
Judges.

PAWLIKOWSKI, Administrative Patent Judge.

**DECISION ON APPEAL**

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 31-70. A copy of claims 31, 35, 36, 41, 42, 52, and 54 is set forth in the attached appendix.

Appellant states that the claims cannot be grouped together. Brief, page 5. The examiner groups the claims as follows: claims 31-35, claims 36-41, claims 42-46, claims 47-51, claims 52-61, and claims 62-70. The examiner states that appellant does not indicate that any of the dependent claims stand or fall separately from a respective independent claim, and when traversing the prior art rejection, the examiner states that appellant does not separately argue dependent claim limitations. The examiner states that, as such, the examiner assumes that appellant intends for all the dependent claims to stand or fall with a respective independent claim. Answer, page 3. We select the broadest claim in each respective rejection for consideration in this appeal. This selection is indicated in



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each of Sections I-XIII, below. See 37 CFR § 1.192(c)(7)(2003), as well as Ex parte Schier, 21 USPQ2d 1016, 1018-19 (Bd. Pat. App. & Int. 1991). See also In re Nielson, 816 F.2d 1567, 1572, 2 USPQ2d 1525, 1528 (Fed. Cir. 1987) and In re Wood, 582 F.2d 638, 642, 199 USPQ 137, 140 (CCPA 1978).

The examiner relies upon the following references as evidence of unpatentability:

Kamada et al. (Kamada)	3,965,212	Jun. 22, 1976
Gallagher et al. (Gallagher)	4,210,739	July 1, 1980
Goldberg et al. (Goldberg)	4,226,926	Oct. 7, 1980
Hanyu et al. (Hanyu)	5,747,557	May 5, 1998
Tang et al. (Tang)	6,037,392	Mar. 14, 2000
Kulesza et al. (Kulesza)	6,106,891	Aug. 22, 2000
Usui et al. (Usui)	6,288,169	Sep. 11, 2001

Claims 41, 43, and 48 stand rejected under 35 U.S.C. § 112, second paragraph, (indefiniteness).

Claims 35, 36, 54, 56 and 66 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

Claims 41-51 stand rejected under 35 U.S.C. § 112, first paragraph, (enablement).

Claims 37, 54, 57, 58, 67 and 68 stand objected to under 37 CFR § 1.75(c) as being of improper dependent form for failing to further limit the subject matter of a previous claim.

Claims 31-33, 35, 37, 38, 42, 45 and 46 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Tang.

Claims 41 and 43 stand rejected under 35 U.S.C. § 102(e) as being anticipated by or, in the alternative, under 35 U.S.C. § 103 as being obvious over Tang.

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Claims 34, 36, 39, 40, 44 and 47-70 stand rejected under 35 U.S.C. § 103 as being obvious over Tang.

Claims 31, 32, 34 and 35 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Usui.

Claim 41 stands rejected under 35 U.S.C. § 102(e) as being anticipated by, or in the alternative, under 35 U.S.C. § 103 as being obvious over Usui.

Claims 52, 54-56, 62 and 64-66 stand rejected under 35 U.S.C. § 103 as being obvious over Usui.

Claims 42, 44 and 46 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Hanyu.

Claim 43 stands rejected under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103 as being obvious over Hanyu.

Claims 45 and 47-51 stand rejected under 35 U.S.C. § 103 as being obvious over Hanyu.

We have carefully reviewed appellant's brief, the answer, and the evidence of record. This review has led us to make the following determinations.

#### **OPINION**

I. The 35 U.S.C. § 112, second paragraph (indefiniteness) rejection of claims 41, 43, and 48

We select claim 41 for consideration.

The examiner's position is set forth on page 6 of the answer. The examiner asserts that the claims are unclear with regard to the toughness measurement because the manner in which the toughness measurement was conducted is not defined in the specification, and the type of toughness is not defined in the specification. The examiner states that toughness can be

measured in a variety of ways, and the examiner refers to several patents that indicate how the toughness is determined. Answer, page 5.

In response, appellant argues that he is allowed to recite the results of his testing without reciting the particulars of the methods used to measure the toughness. Appellant also states that support exists for the particular toughness value on page 11 of the specification, and that the toughness is compared with the toughness values of a commercially available substance.<sup>1</sup> Appellant argues that standards of testing are well known.<sup>2</sup> Brief, pages 6-7.

We find that the comparison made on page 10 of the specification is insufficient to overcome the examiner's prima facie case. The comparison does not indicate what toughness test is used or what type of toughness is measured. Hence, appellant's assertions are not supported by evidence.

In view of the above, we therefore affirm the 35 U.S.C. § 112, second paragraph (indefiniteness) rejection of claims 41 and 43, and 48.

II. The 35 U.S.C. § 112, first paragraph (written description requirement) rejection of claims 35, 36, 54, 56 and 66

We select claim 35, 36, and 54 for consideration in this rejection.

The examiner's position is set forth on page 4 of the answer. The examiner states that appellant has failed to indicate where support can be found for newly added claim limitations in claims 35, 36, 54, 56, and 66.

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<sup>1</sup> We believe appellant meant to refer to page 10 of the specification.

<sup>2</sup> Appellant indicates that the claims have a typo, and thus, "2,500" should be "1,500". In the event of continued prosecution, the examiner, this issue needs consideration.

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With regard to claims 35, 56, and 66, the examiner states that these claims now recite that the epoxy resin is "selected from the group of epoxy resins consisting of polyimides, cyanate esters and combinations thereof".<sup>3</sup> The examiner asserts that the specification fails to teach such a group of epoxy resins. The examiner refers to pages 3-4 of the specification, and states that the specification discloses "epoxies, cyanate esters and bis-maleimides cyanate esters-epoxy polyimides", as three separate types of resins, not that cyanate esters and bismaleimides cyanate esters-epoxy polyimides are part of the epoxy group.

On pages 5-6 of the brief, appellant argues that support for the cyanate esters and epoxy polyimides discussed on pages 3 and 4 of the specification, can be found at the top of page 4 of the specification, wherein reference is made to U.S. Patent No. 6,106,891.

On page 11 of the answer, the examiner responds and states that appellant refers generally to U.S. Patent No. 6,106,891 as providing support for claims 35, 56 and 66, but fails to indicate the location in this patent where support can be found and the examiner states that she cannot find such support in this patent. The examiner refers to the top of column 3 of U.S. Patent No. 6,106,891, which refers to "epoxies, polyimides, and cyanates", and states this disclosure does not teach an epoxy resin selected from the group consisting of polyimides and cyanate esters.

We find that the paragraph bridging pages 3-4 of appellant's specification indicates that the organic materials may include "epoxies, cyanate esters, bismaleimides cyanate esters-epoxies

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<sup>3</sup> We note that claims 56 and 66 recite this language, while claim 35 recites "including at least one epoxy resin material selected from a group of epoxy resin materials consisting of . . .".

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polyimides, benzocyclobutenes, polysulfones, polyetherketones, and combinations thereof". The specification also indicates that encapsulant may include the materials cited in U. S. Patent No. 6,106,891. In the paragraph bridging columns 2 and 3 of U.S. Patent No. 6,106,891, it is indicated that "conventional FR-4 Epoxy and laminates based on high temperature resins such as high temperature epoxies, polyimides, cyanates (triazines), fluoropolymers, ceramic filled fluoropolymers . . .", can be used.

Appellants' claims recite polyimides, cyanate esters, and combinations thereof, as being "epoxy resin materials" or as being "epoxy resins". The examiner's position is that because the specification discloses "epoxies, cyanate esters, bismaleimides cyanate esters-epoxies polyimides, benzocyclobutenes, polysulfones, polyetherketones, and combinations thereof", then, cyanate esters and polyimides are not considered as being "epoxy resins" or "epoxy resin materials".

We agree with the examiner's position because the issue is whether cyanate esters and polyimides are "epoxy resin materials" or "epoxy resins". These compounds do not have an epoxy group. Also, there is no written description found in appellants' specification that these compounds have an epoxy group (see discussion, supra). Appellants' arguments do not address this point either.

In view of the above, we therefore affirm the rejection of claims 35, 56, and 66.

With regard to claim 36, the examiner states that no support can be found for "at least one aliphatic polyol substance of between approximately 0 and 2 percent" by weight. Answer, page 4. Appellants state that the recited percentage of "0 to 2

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percent is recited at the top of page 5". Brief, page 6. We cannot find such disclosure on page 5 of appellants' specification. The examiner points to page 7 of the specification wherein it is disclosed that there is "a first aliphatic polyol of between approximately 1 and 2 percent" and a "second aliphatic polyol of between approximately 0 and 1 percent". We also find such disclosure on page 9 of the specification. The examiner correctly concludes that this disclosure does not support "at least one aliphatic polyol substance of between approximately 0 and 2 percent" by weight. Answer, page 4.

With regard to claim 54, the examiner states that she cannot find support for the "ceramic substrate" because page 2 of the specification specifies organic substrates. Answer, page 4. We find, however, that page 5 of the specification discloses that ceramic based substrates can be used. We therefore disagree with the examiner's position with regard to claim 54.

In view of the above, we therefore affirm the 35 U.S.C. § 112, first paragraph (written description requirement) rejection of claims 35, 36, 56, and 66. However, we reverse this rejection with respect to claim 54.

III. The 35 U.S.C. § 112, first paragraph (enablement) rejection of claims 41-51

We consider claims 41, 43, and 48 together (we select claim 41 as representative of this group), and claims 42, 44-47, and 49-51 together (we select claim 42 as representative of this group), in this rejection.

With regard to claim 41, the examiner states that these claims require a particular "toughness" value, but asserts that the specification fails to describe the type of measurement

conducted to determine the "toughness", and as such there does not appear adequate enablement in the specification for the skilled artisan to arrive at this limitation. Answer, pages 4-6

Because of our determinations made with regard to claims 41, 43, and 48, with respect to the 35 U.S.C. § 112, second paragraph (indefiniteness) rejection of claims 41, 43, and 48, wherein we affirmed the rejection of these claims, we reverse this rejection pro forma. Because we are unable to determine the metes and bounds of these claims, we cannot address the issue as to whether these claims are enabling under 35 U.S.C. § 112, first paragraph. See In re Moore, 439 F.2d 1232, 1235, 169 USPQ 236, 238 (CCPA 1971).

With regard to claim 42, the examiner states that the specification teaches that the core-shell substance is required in the claimed composition to achieve the improved mechanical properties described therein. The examiner refers to page 8 of the specification, which includes the statement that "the invention features an underfill composition having improved mechanical properties resulting from the inclusion of a novel 'core-shell' substance." The examiner states that the skilled artisan would not have been able, by the specification, to make a composition that does not contain such an additive.

It appears that the examiner's position is that because these claims do not recite the "core-shell substance", these claims are not enabled. Appellant addresses this rejection by stating support can be found for claims 42-51 on page 11 of the specification. Brief, page 6. We find that page 11 of the specification does not disclose any subject matter in support of appellant's position. We further agree with the examiner's finding, that page 8 of appellant's specification discloses that it is the inclusion of the core-shell substance, as recited,



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e.g., in appellants' claim 31, which provide for the encapsulant composition.

In view of the above, we reverse the 35 U.S.C. § 112, first paragraph, enablement rejection of claims 41, 43, and 48, pro forma. However, we affirm the 35 U.S.C. § 112, first paragraph, enablement rejection of claims 42, 44-47, and 49-51.

IV. The objection of claims 37, 54, 57, 58, 67, and 68 under 37 CFR 1.75(c) as being of improper dependent form for failing to further limit the subject matter of a previous claim

Because this issue involves an objection to certain claims under 37 CFR §1.75(c), this issue is a petitionable matter, and not an appealable matter. As such, we do not consider this issue in this appeal. See MPEP §§ 706.01 and 1201 (8<sup>th</sup> ed., Rev. 2, May 2004).

V. The 35 U.S.C. § 102(e) rejection of claims 31-33, 35, 37, 38, 42, 45 and 46 as being anticipated by Tang

We consider claims 31 and 32 in this rejection.

The examiner's position for this rejection is set forth on pages 6-7 of the answer. The examiner's position is that Tang discloses the same epoxy resin composition as claimed by appellant. The examiner concludes therefore that the coefficient of thermal expansion as recited in appellant's claim 32 is met by Tang because the composition of Tang is the same as that claimed by appellant in claim 31.

Claim 31 requires a composition comprising a "core-shell" substance including a fine powder, whose particles each have an outer shell with a glass transition temperature above room temperature and a core with a glass transition temperature below room temperature. Appellant's core material can be acrylates and silicone or butadiene-based rubbers. Appellant's shell can

be an acrylate or methacrylate. See page 8, second paragraph of appellant's specification. Tang discloses that the core comprises a polybutadiene or poly(meth)acrylate. See column 5, lines 29-37. The shell is of a crosslinked copolymer as described in column 5, lines 38-68 and column 6, lines 1-30. In particular, the shell can be (meth)acrylates. See column 5, lines 55-58. Appellant's claim 31 requires that the shell has a glass transition temperature above room temperature. Because Tang's shell can be the same material, we agree with the examiner that Tang's shell has the same glass transition temperature. Likewise, Tang's core will have the same glass transition temperature as appellant's core for the same reason. While appellant argues that Tang is forced to cross-link the core to improve toughness, and this reduces his  $T_g$ , appellants' claim 31 does not distinguish from the material in Tang in this regard.

On pages 8 and 9 of the brief, appellant does not dispute that Tang discloses the same epoxy resin composition as that claimed in claim 31. Rather, appellant argues that Tang does not realize or solve the problems described by appellant concerning the use of an encapsulant with an organic substrate or an FCA environment. We note that use limitations of a product being claimed has no significance in a product claim. Cf. In re Wiggins, 397 F.2d 356, 359 n.4, 158 USPQ 199, 201-202 n.4 (CCPA 1968). In the case of In re Wiggins, the court noted that a composition would not appear to be different in any material manner from the composition of appellants' claims no matter to what ultimate use it would be put. Id. We therefore agree with the examiner that use of the encapsulant in an FCA environment and with an organic substrate is not the issue here. Because appellant does not dispute the examiner's findings that Tang discloses the same composition, such supports a prima facie case

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of anticipation, and the burden shifts to appellant to show that Tang does not satisfy the properties as recited in claims 31 and in claim 32. It is well settled that the Patent Office can require appellants to prove that a function or property relied upon for novelty is not possessed by prior art compounds otherwise meeting the limitations of the claims. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

In view of the above, we therefore affirm the rejection of 31-33, 35, 37, 38, 42, 45 and 46 as being anticipated by Tang.

VI. The 35 U.S.C. § 102(e)/103 rejections of claims 41 and 43 over Tang

We consider claims 41 and 43 in this rejection.

As discussed, supra, we affirmed the rejection of involving claim 41 under 35 U.S.C. § 112, second paragraph (indefiniteness). As such, the metes and bounds of appealed claims 41 and 43 are unclear and indefinite to the extent that it is impossible to ascertain the propriety of the grounds of rejection of appealed claims 41 and 43 under 35 U.S.C. § 102(e)/103 over Tang. See In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970); In re Steele, 305 F.2d 859, 862-63, 134 USPQ 292, 295-96 (CCPA 1962).

In view of the above, we therefore reverse, pro forma, the 35 U.S.C. § 102(e)/103 rejection of claims 41 and 43 as being anticipated/obvious over Tang.

VII. The 35 U.S.C. § 103 rejection of claims 34, 36, 39, 40, 44, 47-70 as being obvious over Tang

We consider claims 48, 52 and 54 in this rejection.<sup>4</sup>

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<sup>4</sup> We limit our consideration to only those claims in which appellants argued with a reasonable degree of specificity. As such, claims 48, 52, and 54 are selected for consideration in this rejection. We refer

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Claim 48 is directed to the toughness property. As discussed, supra, we affirmed the rejection of this claim under 35 U.S.C. § 112, second paragraph (indefiniteness). As such, the metes and bounds of appealed claim 48 is unclear and indefinite to the extent that it is impossible to ascertain the propriety of the grounds of rejection of appealed claim 48 under 35 U.S.C. § 102(e)/103 over Tang. See In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970); In re Steele, 305 F.2d 859, 862-63, 134 USPQ 292, 295-96 (CCPA 1962). We therefore reverse the instant rejection of claim 48, pro forma.

With regard to claim 54, claim 54 depends upon claim 52. Claim 52 is directed to a method of encapsulating with an encapsulant composition of the kind recited in claim 31. Hence, as discussed supra, because Tang teaches the same composition as claimed in claim 31, the recited properties of claim 54 are met by the composition of Tang. See our discussion regarding claims 31 and 32, supra.

With regard to claim 52, claim 52 is a method of encapsulating an integrated circuit chip and organic substrate comprising the steps that include re-flowing solder joints between the integrated circuit chip and the substrate. Appellant argues that Tang does not recite a method of reflowing the solder joints between integrated circuit chip and the substrate. Brief, pages 9 and 10.

In response, on page 12 of the answer, the examiner states that method claims 52-70 would have been obvious in view of Tang "in view of the fact that there are conventional steps of encapsulating, and that Tang teaches using the composition as an encapsulate." The examiner refers to the Background of the Invention of Tang. The examiner correctly points out that

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to the paragraph bridging pages 9-10 of the brief in this regard.

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appellant does not address the obviousness of the claimed method.

It is true that appellant does not dispute the examiner's finding that because the composition in Tang is used for encapsulating electronic components, then appellants method claims are conventional in the art. As such, the examiner states an obvious selection would have been an integrated circuit and an organic or ceramic substrate as the electronic component because integrated circuit chips are commonly encapsulated with an epoxy resin compositions. Because appellant does not dispute this finding, we support the examiner's position. We observe that in column 8, at lines 23-28, of Tang, that the epoxy resin compositions are suitable for encapsulating systems for electrical and electronic components.

In view of the above, we affirm the 35 U.S.C. § 103 rejection of claims 34, 36, 39, 40, 44, 47, and 49-70 as being obvious over Tang. We reverse the rejection, pro forma, with respect to claim 48.

VIII. The 35 U.S.C. § 102(e) rejection of claims 31, 32, 34 and 35 as being anticipated by Usui

We consider claims 31 and 32 in this rejection.

The examiner's position for this rejection is set forth on pages 8 and 9 of the answer. The examiner's position is that Usui discloses the same kind of composition as claimed in appellant's claim 31. As such, the examiner states that the same composition would have the claimed coefficient of thermal expansion as recited in appellant's claim 32.

It does not appear that appellant specifically responds to this rejection. Appellant does make a general statement on page 9 of the brief that Usui does not "realize or solve the problems described by appellant." Appellant states that Usui is not

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concerned with organic substrates and that the composition is not utilized in a CFA environment. Brief, page 9. On page 13 of the answer, the examiner also points out that appellant does not address some of the rejections.

Because appellant does not dispute that Usui discloses the same composition as described in appellant's claim 31, we support the examiner's rejection.

In view of the above, we therefore affirm the 35 U.S.C. § 102(e) rejection of claims 31, 32, 34 and 35 as being anticipated by Usui.

IX. The 35 U.S.C. § 102 rejection of claim 41 as being anticipated by or in the alternative under 35 U.S.C. § 103 as being obvious over Usui

This rejection involves the rejection of claim 41. As discussed, supra, we affirmed the rejection of this claim under 35 U.S.C. § 112, second paragraph (indefiniteness). As such, the metes and bounds of appealed claim 41 is unclear and indefinite to the extent that it is impossible to ascertain the propriety of the grounds of rejection of appealed claim 41 under 35 U.S.C. § 102(e)/103 over Tang. See In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970); In re Steele, 305 F.2d 859, 862-63, 134 USPQ 292, 295-96 (CCPA 1962). Hence, we reverse this rejection, pro forma.

In view of the above, we reverse, pro forma, the 35 U.S.C. § 102(e) rejection of claim 41 as being anticipated by, or under the alternative, under 35 U.S.C. § 103, as being obvious over Usui.

X. The 35 U.S.C. § 103 rejection of claims 52, 54-56, 62, and 64-66 as being obvious over Usui

We consider claim 52 in this rejection.

The examiner's position for this rejection is set forth on page 9 of the answer. The examiner's basic position is that Usui teaches that the epoxy resin can be used to encapsulate IC chips and refers to column 1, which refers to both ceramic and organic substrates. The examiner recognizes that the disclosed method does not specifically teach the step of reflowing solder joints, but the examiner states that, as acknowledged by appellant on page 2 of the specification, this is a conventional step in the process of attaching chips to substrates, and therefore the skilled artisan would have readily recognized the need for such a step rendering the claimed method obvious.

Appellant's rebuttal for this rejection is set forth on page 10 of the brief. Appellant does not specifically address the obviousness rejection regarding the method claim 52. Appellant does not dispute the examiner's notice that reflowing solder joints is a conventional step in the process of attaching chips to substrates. As such, we affirm the 35 U.S.C. § 103 rejection of claims 52, 54-56, 62, 64-66 as being obvious over Usui.

XI. The rejection of claims 42, 44 and 46 under 35 U.S.C. § 102(b) as being anticipated by Hanyu

We consider claim 42 in this rejection.

The examiner's position for this rejection is set forth on page 9 of the answer. The examiner makes findings regarding the

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teachings of Hanyu and concludes that the same composition is disclosed in Hanyu as recited in appellant's claim 42.

On pages 10-11 of the brief, appellant rebuts this rejection. Appellant states "Hanyu et al. reference does not teach the purpose of the invention." Appellant does not dispute the examiner's findings that Hanyu discloses the same composition; rather appellant argues the "purpose" of Hanyu's invention versus his invention. For the reasons discussed, supra, we are not convinced by such argument. We again note that use limitations of a product being claimed has no significance in a product claim. Cf. In re Wiggins, 397 F.2d 356, 359 n.4, 158 USPQ 199, 201-202 n.4 (CCPA 1968).

We therefore affirm the 35 U.S.C. § 102(b) rejection of claims 42, 44 and 46 as being anticipated by Hanyu.

XII. The 35 U.S.C. § 102(b) rejection of claim 43 as being anticipated by, or in the alternative as being obvious over Hanyu

Claim 43 is directed to the toughness property. As discussed, supra, we affirmed the rejection of this claim under 35 U.S.C. § 112, second paragraph (indefiniteness). As such, the metes and bounds of appealed claim 43 is unclear and indefinite to the extent that it is impossible to ascertain the propriety of the grounds of rejection of appealed claim 48 under 35 U.S.C. § 102(e)/103 over Tang. See In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970); In re Steele, 305 F.2d 859, 862-63, 134 USPQ 292, 295-96 (CCPA 1962). We therefore reverse this rejection of claim 43, pro forma.

Therefore, we reverse, pro forma, the rejection of claim 43 under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103, as being obvious over Hanyu.



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XIII. The 35 U.S.C. § 103 rejection of claims 45 and 47-51 as being obvious over Hanyu

We consider claim 45 in this rejection. Claim 45 recites that the epoxy material is a cycloaliphatic epoxy resin.

The examiner finds that, at the bottom of column 2 of Hanyu, Hanyu teaches that epoxides such as cycloaliphatic epoxides can be used. Answer, page 10. Hence, the examiner concludes that the selection of such an epoxide would have been obvious.

Appellant responds on pages 10-11 of the brief, and states that the rejection is improper because Hanyu "does not teach the purpose of the invention." As discussed, supra, we note that use limitations of a product being claimed, has no significance in a product claim. Cf. In re Wiggins, 397 F.2d 356, 359 n.4, 158 USPQ 199, 201-202 n.4 (CCPA 1968).

In view of the above, we therefore affirm the 35 U.S.C. § 103 rejection of claims 45, 47, and 49-51 as being obvious over Hanyu.

However, we reverse, pro forma, the rejection of claim 48. As indicated, supra, we affirmed the rejection of this claim under 35 U.S.C. § 112, second paragraph (indefiniteness). As such, the metes and bounds of appealed claim 48 is unclear and indefinite to the extent that it is impossible to ascertain the propriety of the grounds of rejection of appealed claim 48 for this rejection. See In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970); In re Steele, 305 F.2d 859, 862-63, 134 USPQ 292, 295-96 (CCPA 1962).

XIII. Conclusion

The rejection of claims 41, 43, and 48 under 35 U.S.C. § 112, second paragraph, (indefiniteness) is affirmed.

The rejection of claims 35, 36, 56, and 66 under 35

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U.S.C.

§ 112, first paragraph, as failing to comply with the written description requirement is affirmed. However, with respect to claim 54, we reverse this rejection.

The rejection of claims 42, 44-47, and 49-51 under 35 U.S.C. § 112, first paragraph (enablement) is affirmed. However, this rejection is reversed, pro forma, with regard to claims 41, 43, and 48.

The objection to claims 37, 54, 57, 58, 67 and 68 under 37 CFR § 1.75(c) as being of improper dependent form for failing to further limit the subject matter of a previous claim is a petitionable matter, and is not an appealable one.

The rejection of claims 31-33, 35, 37, 38, 42, 45, and 46 under 35 U.S.C. § 102(e) as being anticipated by Tang is affirmed.

The rejection of claims 41 and 43 under 35 U.S.C. § 102(e) as being anticipated by or, in the alternative, under 35 U.S.C. § 103 as being obvious over Tang is reversed, pro forma.

The rejection of claims 34, 36, 39, 40, 44 and 47, and 49-70 under 35 U.S.C. § 103 as being obvious over Tang is affirmed. We reverse this rejection with regard to claim 48, pro forma.

The rejection of claims 31, 32, 34 and 35 under 35 U.S.C. § 102(e) as being anticipated by Usui is affirmed.

The rejection of claim 41 under 35 U.S.C. § 102(e) as being anticipated by, or in the alternative, under 35 U.S.C. § 103 as being obvious over Usui is reversed, pro forma.

The rejection of claims 52, 54-56, 62 and 64-66 under 35 U.S.C. § 103 as being obvious over Usui is affirmed.

The rejection of claims 42, 44, and 46 under 35 U.S.C.

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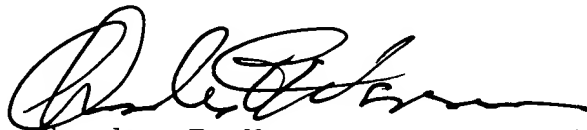
§102(b) as being anticipated by Hanyu is affirmed.

The rejection of claim 43 under 35 U.S.C. §102(b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103 as being obvious over Hanyu is reversed, pro forma.

The rejection of claims 45, 47, and 49-51 under 35 U.S.C. § 103 as being obvious over Hanyu is affirmed. However, we reverse this rejection, pro forma, with respect to claim 48.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv) (effective Sept. 13, 2003; 69 Fed. Reg. 49960 (Aug. 12, 2004); 1286 Off. Gaz. Pat., Office 21 (Sept. 7, 2004)).

**AFFIRMED**



Charles F. Warren )  
Administrative Patent Judge )



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BAP/cam

Appeal No. 2005-0181  
Application No. 09/781,631

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**APPENDIX**

31. A silica-filled Flip-Chip-Attach (FCA) encapsulant composition for use between an integrated circuit chip and an organic or ceramic substrate, comprising a "core-shell" substance including a fine powder, whose particles each have an outer shell with a glass transition temperature above room temperature and a core with a glass transition temperature below room temperature.

35. The silica-filled FCA encapsulant composition in accordance with claim 31, including at least one epoxy resin material selected from a group of epoxy resin materials consisting of: polyimides, cyanate esters, and combinations thereof.

36. A silica-filled flip-chip-attach encapsulant composition comprising by weight:

a cycloaliphatic epoxy resin of between approximately 14 and 25 percent;

a methyl-hexahydrophthalic anhydride of between approximately 14 and 25 percent;

at least one aliphatic polyol substance of between approximately 0 and 2 percent;

2-ethyl-4-methylimidazole of less than approximately 1 percent;

a filler powder comprising silica ( $\text{SiO}_2$ ) in a range of between approximately 40 and 60 percent, with a filler particle size being less than approximately 25 microns; and

an epoxy silane of approximately 0.3 and 0.5 percent.

41. The silica-filled FCA encapsulant composition in accordance with claim 31, wherein said composition has a toughness of between approximately 800 and 2,500 psi-in<sup>1/2</sup>.

42. A silica-filled flip-chip-attach encapsulant composition for use between an integrated circuit chip and a ceramic or organic substrate, comprising:

a) silica fill in a range of approximately between 40 and

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60 percent by weight of the total encapsulant composition; and

b) an epoxy resin and an anhydride, each respectively in an approximate weight range of between 14 and 25 percent by weight of the total encapsulant composition.

52. A method of encapsulating an integrated circuit (IC) chip and an organic substrate in order to form a chip carrier, the steps comprising:

applying a silica-filled encapsulant composition to an IC chip and an organic substrate, said composition comprising particles having a core material with a glass transition temperature,  $T_g$ , below room temperature and a core-shell material substantially surrounding said core material, said core-shell material having a  $T_g$  above room temperature;

curing said encapsulated IC chip and said substrate; and

reflowing solder joints between said IC chip and said substrate.

54. The method of encapsulating an IC chip and a ceramic substrate associated therewith to form a flip-chip-attach (FCA) configuration in accordance with claim 52, wherein said encapsulant composition has a coefficient of thermal expansion (CTE) approximately three times that of said ceramic substrate.